

FUNDING OPPORTUNITY ANNOUNCEMENT NO. DE-FOA-0002737
“CLEAN ENERGY MANUFACTURING INNOVATION INSTITUTE FOR INDUSTRIAL DECARBONIZATION
THROUGH ELECTRIFICATION OF PROCESS HEATING”

TEAMING PARTNER LIST
(INCLUDES SUBMISSIONS UNDER NOTICE OF INTENT NO. DE-FOA-0002748)
UPDATED JULY 6, 2022

Organization Name	Contact Name	Organization Type	Area of Technical Expertise	Brief Description of Capabilities	Area of Interest	Contact Information
Powdermet, Inc	Andrew Sherman	Small business, opportunity zone, HUB zone	Materials science, thermal energy long durations storage systems, phase change materials, rare earth free magnet materials	Materials synthesis, encapsulated metallic phase change materials, thermal energy storage, rare earth free magnetic materials.	Thermal energy storage	Contact Email: ajsherman@powdermetinc.com Contact Phone: (818) 416-6178 Address: 24112 Rockwell Dr, Euclid, Ohio 44117
Machina Labs, Inc.	Dr. Babak Raeisinia	Small Business	Robotic Sheet Metal Manufacturing, Robotic Metal Manufacturing, Advanced Metals and Alloys	Machina Labs is an advanced manufacturing company based in Los Angeles, CA. Machina Labs is working towards its vision of the Factories of the Future, which are software-defined and take advantage of off-the-shelf kinematic solutions, AI/ML, simulations, and advanced sensors. As such, the company has set up its proof-of-concept robotic manufacturing facility in LA. The facility, which houses 22 industrial robots, is currently focused on robotic sheet metal forming. Electrified process heating is an important area of interest as the company has sponsored some preliminary work on that front with the aim of localized robotic heat-treatment.	Collaborative Research, Development, and Demonstration of Electrified Heating Process Modeling and Optimization Tools	Contact Email: br@machinalabs.ai Contact Phone: (770) 769-0114 Address: 9410 Owensmouth Ave, Chatsworth, CA 91311
Purdue University Northwest, CIVS & SMSVC	Chenn Zhou	University	Modeling, Simulation, Visualization, Machine Learning, Digital Twins, Induction Heating, Electrode Plasma Heat Transfer, Applications to iron/steel making processes, melting, drying, pre-heating, annealing, hydrocarbon cracking	The Center for Innovation through Visualization and Simulation (CIVS) is a multidisciplinary center that combines advanced simulation techniques with 3D visualization and virtual-reality technologies. Utilizing state-of-the-art digital technologies to provide innovative solutions to real-world problems, CIVS has been globally recognized for its integrated and application-driven approach. Through close partnerships with more than 160 external organizations, CIVS continues to make substantial educational and economic impacts, resulting in over \$40 million in savings for collaborators.	Collaborative Research, Development, and Demonstration of Electrified Heating Technologies; Process Modeling and Optimization Tools; and Workforce Development and Education	Contact Email: czhou@pnw.edu Contact Phone: (219) 989-2665 Address: 2200 169th Street, Hammond, IN 46323

FUNDING OPPORTUNITY ANNOUNCEMENT NO. DE-FOA-0002737
“CLEAN ENERGY MANUFACTURING INNOVATION INSTITUTE FOR INDUSTRIAL DECARBONIZATION
THROUGH ELECTRIFICATION OF PROCESS HEATING”

TEAMING PARTNER LIST
(INCLUDES SUBMISSIONS UNDER NOTICE OF INTENT NO. DE-FOA-0002748)
UPDATED JULY 6, 2022

Organization Name	Contact Name	Organization Type	Area of Technical Expertise	Brief Description of Capabilities	Area of Interest	Contact Information
Solugen, Inc	Dr. Benjamin Zalisko	Company	Chemistry, Biochemistry, Chemical Engineering	Solugen makes a variety of chemical products from biological feedstocks using processes that are cell-free, waste-free, and emission-free. In 2021, Solugen fully scaled to 10,000 tons of product per year at its Houston facility. Now, entering a stage of rapid growth, Solugen plans to build 5 more of those chemical plants over the next 5 years, using the latest green-energy technology.	Solugen is building new manufacturing facilities with hopes to include fully-integrated, customized electric process heating systems. We are interested in financial support for these new systems and integrating other new technologies	Contact Email: benjamin.zalisko@solugen.com Contact Phone: (832) 295-8570 Address: 14549 Minetta St, Houston, TX 77035
Rensselaer Polytechnic Institute Center for Future Energy Systems (CFES)	Brian Apkarian	Research University	Solar and wind energy, energy storage, electrification, green hydrogen, smart-grid, and energy efficient technologies	Located on the campus of Rensselaer Polytechnic Institute in Troy, NY. Our center is one of Empire State Development's Division of Science, Technology & Innovation's 15 designated Centers for Advanced Technology. Dr. Jian Sun is the Director of the center and leads a team of over 30 research faculty and support staff. Our mission is to pair the talent and resources of a world-leading research university with industry innovators to move technology from the lab to the marketplace for an energy-sustainable future.	To be a R&D collaborator with industry and other partners	Contact Email: apkarb@rpi.edu Contact Phone: (518) 276-6953 Address: 110 8th Street, Troy, NY 12180
C2A Sustainable Solutions, LLC	Riyaz Papar	LLC	Industrial thermal system optimization	Energy and engineering consulting; Industrial Energy Efficiency Projects - design, specify, implementation; Capacity building – Best practices training & resource development	Industrial sectors; process heating; process cooling; refrigeration; steam; chilled water plants	Contact Email: rapapar@c2asustainable.com Contact Phone: (281) 610 5561 Address: 14 Split Rail Place, The Woodlands, TX 77382

FUNDING OPPORTUNITY ANNOUNCEMENT NO. DE-FOA-0002737
“CLEAN ENERGY MANUFACTURING INNOVATION INSTITUTE FOR INDUSTRIAL DECARBONIZATION
THROUGH ELECTRIFICATION OF PROCESS HEATING”

TEAMING PARTNER LIST
(INCLUDES SUBMISSIONS UNDER NOTICE OF INTENT NO. DE-FOA-0002748)
UPDATED JULY 6, 2022

Organization Name	Contact Name	Organization Type	Area of Technical Expertise	Brief Description of Capabilities	Area of Interest	Contact Information
HiT Nano	Dr. Christopher Abram	Small business	Advanced manufacturing of energy storage and conversion materials including Li-ion battery materials, thermal energy storage media, and catalysts	Green materials synthesis using electric heating, scale-up, materials characterization, battery characterization	Collaborative Research, Development, and Demonstration of Electrified Heating Technologies	Contact Email: cabram@hitnanoinc.com Contact Phone: (267) 824-6777 Address: 1200 Florence Columbus Road, Bordentown NJ 08505
Heavy Oil Solutions, Inc.	Steve Yarbrow	For profit small business (<10 full-time employees)	Chemical, electrical and mechanical engineering design, modeling and operation of direct electrically-heated, high-temperature (500 deg C currently) and high-pressure (4000 psig currently) tubular electrochemical reactors for processing petroleum compounds	Heavy Oil Solutions (HOS) has built and is currently testing and operating a tubular electrochemical reactor (TER) to take advantage of the benefits of process and chemistry electrification in the renewable fuel and fossil fuel industries. HOS is researching combined electrolysis and TER that addresses the question of how multiple components are designed that work together to enable stable, efficient electrolysis for carbon-free production of hydrogen from water. One of the initial research goals was to increase the efficiency of producing supercritical water in a commercially scalable reactor design. Direct electrical heating of the tubing, exploiting the electrical resistance of the tubing, enables a simple, clean reactor design (no furnace enclosure or external heater bands) and electrical energy to heat conversion efficiencies of 90%. Furthermore, it enabled precise wall temperature control, eliminating local overheating that caused 'coking' and reactor plugging with conventional heating methods.	Collaborative Research, Development, and Demonstration of Electrified Heating Technologies	Contact Email: steve.yarbro@heavyoilsolutions.com Contact Phone: (505) 412-2934 Address: 5101 College Blvd, Farmington, NM 87402

FUNDING OPPORTUNITY ANNOUNCEMENT NO. DE-FOA-0002737
“CLEAN ENERGY MANUFACTURING INNOVATION INSTITUTE FOR INDUSTRIAL DECARBONIZATION
THROUGH ELECTRIFICATION OF PROCESS HEATING”

TEAMING PARTNER LIST
(INCLUDES SUBMISSIONS UNDER NOTICE OF INTENT NO. DE-FOA-0002748)
UPDATED JULY 6, 2022

Organization Name	Contact Name	Organization Type	Area of Technical Expertise	Brief Description of Capabilities	Area of Interest	Contact Information
Raytheon Technologies Research Center	Dr. Ying She	Large Business	Process modeling and simulations such as C/C CVI process for carbon brake manufacturing, CMC interface coatings and matrix densification fabrications. Various process developments such as thin film depositions, H2 production and separation for fuel cell applications, etc. Chemical reaction kinetics and thermodynamics. Material processing for additive manufacturing.	RTRC, the corporate research center for Raytheon Technologies Corporation (RTX), is headquartered in a 420,000 ft2 complex in East Hartford, CT. RTRC plays a key role as the corporation's innovation engine, focusing on advanced technologies. The center employs approximately 300 research scientists, engineers, and support staff, 80% of whom are technical staff (75% of technical staff have advanced degrees). RTRC performs basic, applied and exploratory research in a broad spectrum of technologies including chemical sciences, fluid mechanics, electronics materials and structures, information technology, and systems technology. The center has component and system level modeling tools, material development laboratories, fabrication and characterization laboratories, and combustion test facilities for component and prototype system testing	Development of process modeling and optimization tools; Technology and market analysis; Improvement of electrification efficiency via exploring innovative manufacturing processes.	Contact Email: ying.she@rtx.com Contact Phone: (860) 610-7070 Address: 411 Silver Lane, East Hartford, CT 06118
Infineon Technologies Americas Corp.	Tim McDonald		Infineon Technologies has broad expertise in power conversion systems, solutions, and components.	Infineon Technologies Americas Corp. provides semiconductor solutions to support digitalization and electrification. The Company designs, manufactures, and markets power semiconductors, microcontrollers including security ICs, LED drivers, sensors, automotive, and power management ICs as well as a range of additional products. Experienced with fitting semiconductor and software products to their end system requirements. We can complement academic, national lab and industrial systems companies to partner on solution and path finding for electrification of thermal processing.	We can complement academic, national lab and industrial systems companies to partner on solution and path finding for electrification of thermal processing.	Contact Email: Tim.McDonald@infineon.com Contact Phone: (310) 528-9976 Address: 101 N Pacific Coast Hwy El Segundo, CA, 90245-4318

FUNDING OPPORTUNITY ANNOUNCEMENT NO. DE-FOA-0002737
“CLEAN ENERGY MANUFACTURING INNOVATION INSTITUTE FOR INDUSTRIAL DECARBONIZATION
THROUGH ELECTRIFICATION OF PROCESS HEATING”

TEAMING PARTNER LIST
(INCLUDES SUBMISSIONS UNDER NOTICE OF INTENT NO. DE-FOA-0002748)
UPDATED JULY 6, 2022

Organization Name	Contact Name	Organization Type	Area of Technical Expertise	Brief Description of Capabilities	Area of Interest	Contact Information
Siemens Corporation, Technology	Erika Gupta	Large Business	Industrial Process Modeling, Simulation, Control and Automation, Additive Manufacturing & Materials, and Sustainable Manufacturing	Siemens provides advanced process modeling tools, plant simulation & automation, and environments covering the entire process lifecycle, from R&D through Engineering Design to Operations and Manufacturing. Siemens has expertise in decarbonization of industrial sites and processes including electrification and fuel switching (e.g. to hydrogen). In particular, Siemens Process Systems Engineering (Siemens PSE) offers the gPROMS® advanced process modeling platform for digital process design and operations. In addition to providing the modeling software technology that can simulate and optimize electrified processes, Siemens PSE has a team of experienced process modeling engineers who can support the development and application of such models.	<ul style="list-style-type: none"> • Collaborative Research, Development, and Demonstration of Electrified Heating Technologies • Process Modeling and Optimization Tools 	Contact Email: erika.gupta@siemens.com Contact Phone: (609) 216-6248 Address: 755 College Road East, Princeton, NJ 08540

FUNDING OPPORTUNITY ANNOUNCEMENT NO. DE-FOA-0002737
“CLEAN ENERGY MANUFACTURING INNOVATION INSTITUTE FOR INDUSTRIAL DECARBONIZATION
THROUGH ELECTRIFICATION OF PROCESS HEATING”

TEAMING PARTNER LIST
(INCLUDES SUBMISSIONS UNDER NOTICE OF INTENT NO. DE-FOA-0002748)
UPDATED JULY 6, 2022

Organization Name	Contact Name	Organization Type	Area of Technical Expertise	Brief Description of Capabilities	Area of Interest	Contact Information
Treasure8 LLC	Timothy Childs	For-profit organization	<p>Treasure8 is a technology and partnership platform focused on Decarbonizing, Degassing through Dehydration.</p> <p>Our core patented technology is exclusively licensed from the USDA and is a unique and proprietary system of food dehydration that utilizes energy-efficient processes to drive increased sensory benefits while lowering energy costs. Our technology can produce freeze-dried ingredients with surprisingly lower costs and with higher quality while reducing carbon to accompany greater food safety.</p>	<p>Treasure8 is the leading expert and exclusive global provider for SAUNA technology. SAUNA is a low-energy source to achieve simultaneous dry blanching and quick partial dehydration of fresh vegetables and fruits (as well as most food groups), followed by final drying using either hot air or Freeze-drying and potentially any other industrially useful drying technology. SAUNA technology consistently provides benefits of energy & GHG savings, nutritional retention, and sensory superiority to other methods of drying than those they would achieve by themselves.</p>	<ul style="list-style-type: none"> • Collaborative Research, Development, and Demonstration of Electrified Heating • Technologies • Process Modeling and Optimization Tools for Decarbon and Degassing in Dehydration • Technology and Market Analysis • Energy Justice and Diversity, Equity, Inclusion, and Accessibility (DEIA). 	<p>Contact Email: grants@treasure8.com</p> <p>Contact Phone: (415) 291-9192</p> <p>Address: 6257 Gordon Valley Rd. Napa, CA 94558</p>

FUNDING OPPORTUNITY ANNOUNCEMENT NO. DE-FOA-0002737
“CLEAN ENERGY MANUFACTURING INNOVATION INSTITUTE FOR INDUSTRIAL DECARBONIZATION
THROUGH ELECTRIFICATION OF PROCESS HEATING”

TEAMING PARTNER LIST
(INCLUDES SUBMISSIONS UNDER NOTICE OF INTENT NO. DE-FOA-0002748)
UPDATED JULY 6, 2022

Organization Name	Contact Name	Organization Type	Area of Technical Expertise	Brief Description of Capabilities	Area of Interest	Contact Information
Texas State University	Andres Carvallo	University		We are moving our advanced prototyping labs into a Smart Factory Lab at STAR Park (our 100 acres smart cities research location) that will house prototyping, modeling, flexible assembly, and small volume manufacturing Industry 4.0 capabilities. Our manufacturing, industrial, electrical and mechanical engineering programs collaborate in designing, prototyping, modeling and building next generation solutions using new materials, AI/ML, Internet of Things, processes, methods and tools. Digital Twinning is a core competency that we bring to this new lab. Additionally, we are building a smart Energy lab (10,000 sq. ft.) and a smart utilities lab (5,000 sq. ft.) focus on applied research about Solar PV, fuel cells, energy storage, EV charging, V2G/V2X, tracking systems, energy management systems (VVO / DRMS / DERMS / VPP), metering, trading systems, blockchain, AI/ML/Analytics, and green hydrogen; as well as Smart grid management (Sub / Transformers / Distribution-Wires, meters, systems (e.g. DCS / GMS / OMS / DMS / ADMS / AMI), SCADA and energy management systems, control systems (CVR, FDIR, FLISR, Power Factor, Harmonics, Modulation, Power Electronics), Transformers, Reclosers, Switches, Feeders, Tap Changers, Bushings, HV Wires, MV Wires, LV Wires, Cap Banks, energy storage, EV charging, metering, trading systems, blockchain, AI / ML / Analytics, communications networks, cybersecurity.	Collaborative Research, Development and Demonstration of Electrified Heating Technologies. Process Modeling and Optimization Tools.	Contact Email: andres.carvallo@txstate.edu Contact Phone: (512) 968-8108 Address:

FUNDING OPPORTUNITY ANNOUNCEMENT NO. DE-FOA-0002737
“CLEAN ENERGY MANUFACTURING INNOVATION INSTITUTE FOR INDUSTRIAL DECARBONIZATION
THROUGH ELECTRIFICATION OF PROCESS HEATING”

TEAMING PARTNER LIST
(INCLUDES SUBMISSIONS UNDER NOTICE OF INTENT NO. DE-FOA-0002748)
UPDATED JULY 6, 2022

Organization Name	Contact Name	Organization Type	Area of Technical Expertise	Brief Description of Capabilities	Area of Interest	Contact Information
Electric Power Research Institute	Baskar Vairamohan	Non-profit Organization	EPRI focuses on Collaborative Research, Development and Demonstration projects with end-use industrial customers through utility-industry partnership.	EPRI engages with electric utilities, technology providers, industry trade organizations to conduct research and technical applications of innovative electric process heating technologies, and technology training on end-use technologies. These engagements include models and tools development to conduct technology market analysis. EPRI also works with government organizations and utilities in technology demonstration projects, and performs facility technical energy, electrification, water and carbon assessments. Additionally, EPRI conducts technology training for workforce development through EPRI U.	Collaborative R,D & D, technology training, workforce development and education, techno-economic analysis, electrification and energy assessment.	Contact Email: bvairamohan@epri.com Contact Phone: (865) 218-8189 Address: 942 Corridor Park Blvd, Knoxville, TN - 37932
Oklahoma State University	Zheyu Jiang	Academic institution	Process modeling and optimization, energy systems modeling, distillation process synthesis and design	My research group has rich research experience and technical expertise in conceptual process synthesis and design, mathematical modeling optimization of distillation systems. In particular, the PI had the experience to develop the first optimization tool that, for a given multicomponent distillation task, screens through all possible distillation configurations and identifies the ones with lowest minimum exergy loss requirement, while determining their corresponding optimal operating conditions. Exergy loss is a quantity that measures the energy required to drive distillation purely using work (i.e., electricity) instead of heat. Therefore, this optimization tool can be directly used to identify attractive distillation configurations that are attractive for using heat pumps, which is an effective way of replacing process heating with electricity. Furthermore, the PI has worked on process intensification of multicomponent distillation systems and proposed a new systematic procedure for synthesizing new and fully operable heat-pump assisted distillation systems that can save up to 50% of energy consumption compared to conventional columns.	Process Modeling and Optimization Tools	Contact Email: zheyu.jiang@okstate.edu Contact Phone: (405) 744-3320 Address: 420 Engineering North, Stillwater, OK 74078

FUNDING OPPORTUNITY ANNOUNCEMENT NO. DE-FOA-0002737
“CLEAN ENERGY MANUFACTURING INNOVATION INSTITUTE FOR INDUSTRIAL DECARBONIZATION
THROUGH ELECTRIFICATION OF PROCESS HEATING”

TEAMING PARTNER LIST
(INCLUDES SUBMISSIONS UNDER NOTICE OF INTENT NO. DE-FOA-0002748)
UPDATED JULY 6, 2022

Organization Name	Contact Name	Organization Type	Area of Technical Expertise	Brief Description of Capabilities	Area of Interest	Contact Information
Oak Ridge National Laboratory	Bill Peter	DOE National Laboratory / Federally Funded Research and Development Centers (FFRDC)	modeling simulation; data analytics, visualization and artificial intelligence; controls and automation; experimentation including new materials and systems; industrial assessments and computation tool development; and new approaches to technology deployment, manufacturing analysis and simulation, composites and polymer systems, metal powder systems, metrology and characterization, machine tooling, large-scale metal systems, and robotics and automation	ORNL has four decades of experience leading key efforts in the electrification of industrial processes and has significant expertise and capabilities related to this area. ORNL draws upon unmatched capabilities in materials, neutrons, and computational science to develop innovative manufacturing technologies, helping large and small companies alike. ORNL works with original equipment manufacturers, material suppliers and end users to revolutionize the way products are designed, built, post-processed and qualified. Research and development in advanced manufacturing enables opportunities for product customization, improved performance, multifunctionality and lower overall manufacturing costs. ORNL's Manufacturing Demonstration Facility (MDF), established in 2012, is one of the Department of Energy's designated user facilities focused on performing early-stage research and development to improve the energy and material efficiency, productivity, and competitiveness of American manufacturers. The MDF has over 100 electric based systems and process technologies with research focused on manufacturing analysis and simulation, composites and polymer systems, large-scale metal systems, metal powder systems, machine tooling, robotics and automation, process heating and drying and metrology and characterization.	<ul style="list-style-type: none"> •Collaborative Research, Development, and Demonstration of Electrified Heating Technologies: •Process Modeling and Optimization Tools •Technology and Market Analysis •Workforce Development and Education •Energy Justice and Diversity, Equity, Inclusion, and Accessibility (DEIA) 	Contact Email: peterwh@ornl.gov Contact Phone: (865) 241-8113 Address: 1 Bethel Valley Rd, Oak Ridge, TN 37830
Malachite Technologies, Inc.	Alex Welsh, Engineering Director	Small Business, C-Corp	Process reactor design and integration with a focus on microwave/RF assisted heating, thermal and non-thermal plasmas, and induction heating.	Engineering design (mechanical, electrical, controls) Process development and demonstration Hardware integration of R&D and pilot scale processing systems	Process reactor design and integration with a focus on microwave/RF assisted heating, thermal and non-thermal plasmas, and induction heating.	Contact Email: awelsh@malachitetech.com Contact Phone: (415) 787-2509 Address: 2262 Palou Ave San Francisco, CA 94124

FUNDING OPPORTUNITY ANNOUNCEMENT NO. DE-FOA-0002737
“CLEAN ENERGY MANUFACTURING INNOVATION INSTITUTE FOR INDUSTRIAL DECARBONIZATION
THROUGH ELECTRIFICATION OF PROCESS HEATING”

TEAMING PARTNER LIST
(INCLUDES SUBMISSIONS UNDER NOTICE OF INTENT NO. DE-FOA-0002748)
UPDATED JULY 6, 2022

Organization Name	Contact Name	Organization Type	Area of Technical Expertise	Brief Description of Capabilities	Area of Interest	Contact Information
University of Arizona, Department of Aerospace and Mechanical Engineering	Peiwen Li	Academia, Public University	Thermal-science; heat/mass transfer and enhancement; multi-physics of electrochemical devices for energy and power application; optimization of concentrated solar power system	<ul style="list-style-type: none"> • Lab has equipment and capabilities for measurement of high temperature thermophysical properties of molten salts and solid materials. • Molten chloride salt test loop capable of measuring heat transfer, corrosion at temperatures up to 800 oC. • A water circulation loop to test heat transfer enhancement of pipes. • Algorithm for optimization of concentrated solar power system. • Experience of experimental characterization of thermophysical properties, heat transfer. 	<ul style="list-style-type: none"> • Characterization of thermophysical properties of high temperature heat transfer fluids and solids for concentrated solar power. • Thermal energy storage analysis and optimization. • Special and efficient heat exchangers. • Solar energy driven clean water technologies. • Electrolysis and fuel cell development and optimization • Concentrated solar power system optimization 	<p>Contact Email: peiwen@arizona.edu</p> <p>Contact Phone: (520) 529-1879</p> <p>Address: 1130 N. Mountain Ave. Tucson, AZ 85721.</p>